

REMARKS

By this submission original claims 4, 5, 8, 15 and 18 are amended, and original claims 1-3, 6, 7, 9-14, 16, 17 and 19-20 continue to be pending. Also, previously submitted claims 21-24 continue to be pending. No new matter is introduced by the now submitted amendments.

It is requested in view of the submitted amendments and the following discussions that all reported rejections in the outstanding Office action be reconsidered and not repeated in any further action issued for this application.

Claim Rejections – 35 USC §103

It is reported in the outstanding Office action that claims 1-3, 6, 7, 11-14, 16 and 17 are rejected under 35 USC §103(a) as being unpatentable over US Patent 6,080,271 (“Fujii”).

Of the reported obviousness rejections only claims 1 and 12 are independent and all other reported obviousness rejections are directed to claims dependent from these two independent claims. Under these circumstances attention here will be exclusively directed to these two independent claims because if these two claims are patentable then all of their dependent claims also recite allowable subject matter.¹ For the record, this submission concerning 35 USC §103(a) rejections reported for the two independent claims is made without admissions as to any rejections of record that are directed to dependent claims.

Both independent claims 1 and 12 are reported rejected under 35 USC §103(a) over Fujii, because it is asserted in the Office action that this patent “disclose[s] a matching method (See Figure 4A) for coupling an RF power supply (10) to an RF antenna (8) in a plasma generator comprising:

a resonantly tunable circuit formed of a variable capacitor (22)
and a inductor (21) in a series resonance configuration;

a transformer (transformer within detector 20, See Col. 5, lines
6-24) coupled to the resonantly tunable circuit.” (Office action
page 2)

¹ “Dependent claims are nonobvious under 103 if the independent claims from which they depend are nonobvious.” (Citation omitted, In re Fine, 5USPQ2D 1596, 1600 (Fed. Cir. 1988))

These assertions concerning Fujii disclosures are reported as being both directed to claims 1 and 12 recited limitations. Further assertions concerning Fujii disclosures are reported in the context of claim 12 recited limitations at pages 3 and 4 of the Office action, but such further assertions are not considered here because it is submitted that the above reproduced assertions include failures by Fujii to disclose or suggest limitations recited in both claims 1 and 12. For instance, both claims 1 and 12 recite among other limitations “a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration.” Asserted in the Office action is the conclusion that Fujii variable capacitor (22) and inductor (21) are “in a series resonance configuration” to be a “resonantly tunable circuit.” These assertions concerning combination of variable capacitor 22 and inductor 21 to be the Fujii disclosed impedance matching circuit are traversed.

References identified in the Office action from Fujii to support these assertions are made to Fujii Figure 4A and col. 5, lines 6-24 disclosures, both of which are reproduced below to facilitate their considerations.

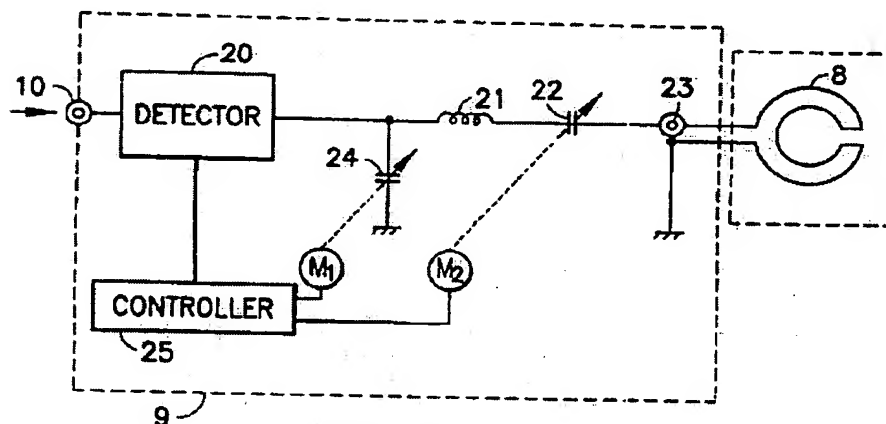


FIG.4A

[The antenna] coil is fed with high frequency power through an impedance matching circuit as shown in FIG. 4. Disposed in a box 9 for an impedance matching unit is an impedance matching circuit as shown in FIG 4A or B. In FIG 4A, the high frequency power fed through an RF power input connector 10 installed in the matching unit box is passed through a detecting section 20 provided with an instrument transformer, and successively through a matching coil 21 and a phase adjusting capacitor 22, whose capacitance is variable, into an output terminal 23, from which it is fed to the signal potential terminal of the antenna coil 8, flowing back from the grounded terminal. A load impedance adjusting capacitor 24, whose capacitance is

also variable, is interposed between the grounded potential and the connecting line between the detecting section 20 and the choke coil 21, said capacitor 24 together with the phase adjusting capacitor 22 being adjusted by the control section 25 through respective servo motors M1 and M2, to emit a control signal according to the detection signal. (Col. 5, lines 6-24)

Instead of “a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration” as is recited in both independent claims 1 and 12, Fujii explicitly discloses a matching unit box 9 into which RF power is “passed through a detecting section 20 provided with an instrument transformer, and successively through a matching coil 21 and a phase adjusting capacitor 22, whose capacitance is variable, into...the antenna coil 8, flowing back from the grounded terminal [,and a] load impedance adjusting capacitor 24, whose capacitance is also variable, [that] is interposed between the detecting section 20 and the choke coil 21, said capacitor 24 together with the phase adjusting capacitor 22 being adjusted....” (Emphasis added, col. 5, lines 11-22) Plain explicit reading of the Fujii disclosed matching unit box 9 circuit teaches that the circuit includes both (i) a series connected matching coil 21 with a phase adjusting capacitor 22 connected to the antenna 8, and also (ii) an impedance adjusting capacitor 24 that is connected in parallel with the antenna coil 8. There is no Fujii understood modification for the Figure 4A matching unit box 9 circuit other than that disclosed in Figure 4B, which lacks a matching coil 21 and includes the phase and impedance adjusting capacitors 22 and 24 individually connected to an input and output of the antenna coil 8 and ground. The Fujii disclosed matching unit box 9 shown in Figure 4B irrefutably fails to disclose or suggest claim 1 or 12 recited subject matter.

Returning to Fujii Figure 4A disclosed matching unit box 9 circuitry, the Office action asserted reading for this subject matter selectively disregards, and in point of fact excludes, the impedance adjusting capacitor 24 of the patent taught circuit. No explanation, much less justification, for this selective exclusion is understood from the Office action. As the record stands, the apparent justification for exclusion of this taught impedance adjusting variable capacitor from the circuit is the disclosures and recitations in the pending application. No other source is understood for teaching or suggesting such modification of the Fujii circuit

than the disclosures and recitations in the pending application.² What other source could there be? After all Fujii discloses:

A box 9 for an impedance matching unit is placed on the magnetically permeable core 7, and installed in said box are impedance matching elements..., such as a detector, a load impedance variable capacitor, and a phase variable capacitor.
(col. 4, lines 1-5)

Exclusion of the only identified impedance variable capacitor from an impedance matching unit, which in the case of the Figure 4A circuit is variable capacitor 24, without explanation begs a conclusion that the Fujii disclosures are being selectively read in the context of the pending application and claims. A person of ordinary skill in this art it is submitted would not exclude this explicitly functional labeled component, i.e., impedance adjusting capacitor 24.

Among other failures in Fujii to disclose or suggest claimed subject matter, it also is noted for the record are this patent's explicit disclosures that the matching unit box 9 include both a "detecting section 20 provided with an instrument transformer" (col. 5, lines 12-13) and a "control section 25" to dynamically adjust both the impedance and phase capacitors 24 and 22 "through respective servo motors M1 and M2, to emit a control signal according to the detection signal" (col. 5, lines 21-23). These disclosures further confirm that the Fujii disclosed Figure 4A impedance matching circuit is intended to include both a phase adjusting capacitor 22 connected in series with a matching coil 21 and also an impedance adjusting capacitor 24 connected in parallel with the antenna coil 8.

With respect to detecting section 20 that is disclosed by Fujii as being provided with an instrument transformer, it is noted that such a transformer is known to be a specialized transformer to those of ordinary skill in this art. In support of this statement, reference is invited to page 478 from the IEEE Standard Dictionary of Electrical and Electronic Terms, ANSI/IEEE Std. 100-1988, Fourth Edition, 1988 where the term "instrument transformer" is defined. A copy of this page is concurrently being submitted under an Information Disclosure Statement. Specifically, it is reported there that an "instrument transformer" is "A transformer that is intended to reproduce in its secondary circuit, in a definite and known proportion, the current or voltage of its primary circuit with the phase relations substantially

² MPEP §2143 directs: "The teaching or suggestion to make the claimed combination and the reasonable expectation for success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947

preserved.” Whether or not such a transformer can or can not be substituted for the transformer disclosed and recited in the pending application now is not contested. Instead what is raised are the facts that Fujii disclosures require a specialized transformer to provide a detection signal to a control section 25 to power servo motors to adjust both a phase adjusting capacitor and an impedance adjusting capacitor. In contradicting contrast the pending application discloses that:

The transformer T serves two functions. First, it electrically isolates the ion source 26 from the RF amplifier 20, enabling the ion source 26 to float to a potential other than the RF source 20. Second, the turn ratio between the primary windings 16 and secondary winding 14, which typically ranges from 3:1 to 8:1, is selected to transform the plasma impedance to 50Ω . The circuit 12 is tuned to resonance by adjusting the capacitance C; resonance is indicated by a minimum in the reflected power. (Original Filed Application Specification, page 3, line 21, to page 4, line 2).

The pending application discloses and recites adjustment of a single variable capacitor connected in series with an inductor to achieve resonance as opposed to adjustment of both a series connected phase adjusting capacitor and a parallel connected impedance adjusting capacitor to achieve some desired condition as is disclosed in Fujii.

Accordingly, Fujii does not disclose or suggest all limitations recited in pending independent claims 1 and 12. Therefore, it is submitted in line with the above discussions that reported obviousness rejections of claims 1 and 12 and claims dependent from these two independent claims are overcome.

In conclusion all obviousness reported rejections are traversed as is discussed above.

Allowable Subject Matter

Claims 21-24 are reported in the Office action as being allowed, and claims 4, 5, 8-10, 15 and 18-20 are reported as objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to the reported objected to claims that would be allowable if rewritten, these claims by this submission have been rewritten to include all of the limitations of base claims and any intervening claims in all cases where a claim reported as being objected to is

not dependent from another objected to claim. These so rewritten claims now are in independent form. All of the remaining objected to claims are dependent from one of these rewritten independent claims. Allowances of all of these previously objected to claims as is reported in the Office action now should be in order.

CONCLUSION

In light of the above discussions, it is believed that all previously pending claims and all now submitted amended claims are in condition for allowance and a notice of the same is requested. Should the Examiner have any question, request or suggestion, he is invited to contact the undersigned attorney at the telephone number indicated below.

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Respectfully submitted,

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